

Claims

1. A speaker comprising first and second diaphragms arranged to be driven in opposite phase with respect to one another.
- 5 2. A speaker according to claim 1, wherein each of the first and second diaphragms comprises an element which exhibits a piezo-electric effect.
- 10 3. A speaker according to claim 2, wherein the element comprises a piezo-electric film having a conductive coating on each side.
- 15 4. A speaker according to claim 3, wherein the film comprises polyvinylidene fluoride (PVDF).
5. A speaker according to claim 3, wherein the coating is indium tin oxide (ITO).
- 20 6. A speaker according to claim 1, wherein the first and second diaphragms are mounted on either side of an insulating support.
7. A speaker according to claim 1, wherein the first and second diaphragms enclose a cavity.
- 25 8. A speaker according to claim 7, wherein the first and second diaphragms are arranged to be driven so that the volume of the cavity remains substantially constant.
9. A speaker according to claim 7, wherein the cavity is filled with a gas to keep the first and second diaphragms in tension.
- 30 10. A speaker according to claim 9, wherein the gas is sulphur tetrafluoride.

11. A speaker comprising first and second opposed diaphragms, the diaphragms being arranged to be driven so that, in use, they move in the same direction with respect to one another.
- 5 12. A speaker according to claim 11, wherein the first and second diaphragms enclose a cavity.
- 10 13. A speaker according to claim 12, wherein the first and second diaphragms are arranged to be driven so that the volume of the cavity remains substantially constant.
14. A speaker according to claim 12, wherein the cavity is filled with a gas to keep the first and second diaphragms in tension.
- 15 15. A speaker according to claim 14, wherein the gas is sulphur tetrafluoride.
16. An electronic device including a speaker according to claim 1.
- 20 17. An electronic device according to claim 16 including a display, wherein the speaker is transparent and is mounted over the display, so that the display is visible through the speaker.
18. An electronic device according to claim 17 which is portable.
- 25 19. A portable electronic device according to claim 18 comprising a mobile telephone.
20. An electronic device including a display and a transparent speaker, the speaker being mounted in front of the display so that the display is visible through the speaker.
- 30 21. An electronic device according to claim 20, wherein the speaker comprises a piezoelectric film speaker.

22. An electronic device according to claim 21, wherein the piezoelectric film speaker has at least one diaphragm.
- 5 23. An electronic device according to claim 22, wherein the piezoelectric film speaker has a dual diaphragm.
24. An electronic device according to claim 22, wherein said at least one diaphragm comprises an element which exhibits a piezo-electric effect.
- 10 25. An electronic device according to claim 24, wherein the element comprises a piezo-electric film having a conductive coating on each side.
- 15 26. An electronic device according to claim 25, wherein the film comprises polyvinylidene fluoride (PVDF).
27. An electronic device according to claim 25, wherein the coating is indium tin oxide (ITO).
- 20 28. An electronic device according to claim 20, which is portable.